

No. 884,955.

PATENTED APR. 14, 1908

F. W. RICHES.

TELEMETER FOR THE USE OF PHOTOGRAPHERS.

APPLICATION FILED JUNE 9, 1906.

6 SHEETS—SHEET 1.

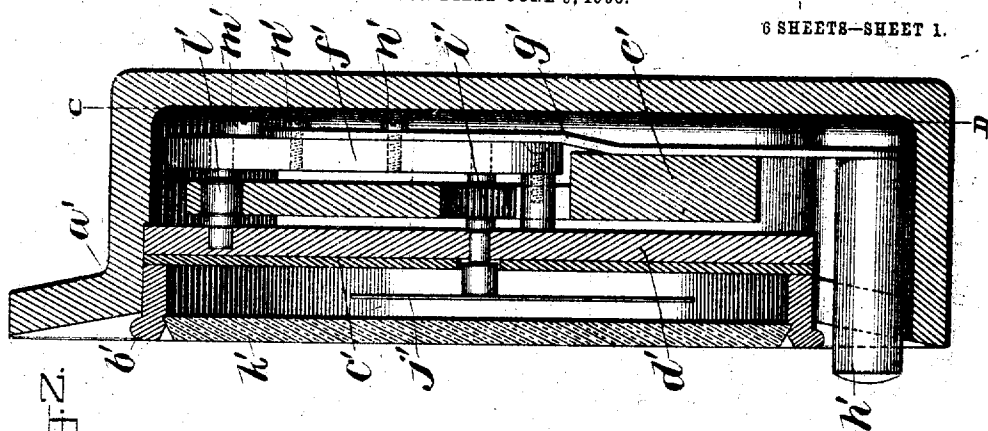


Fig. 2.

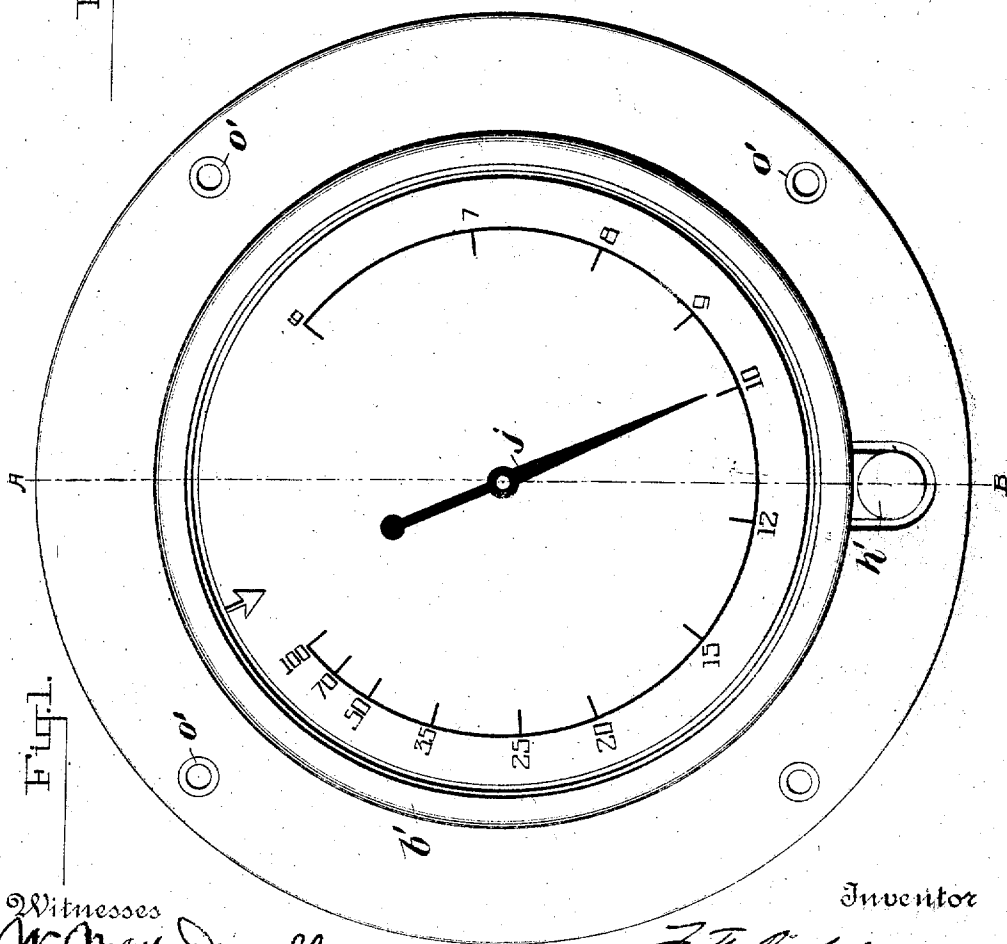


Fig. 1.

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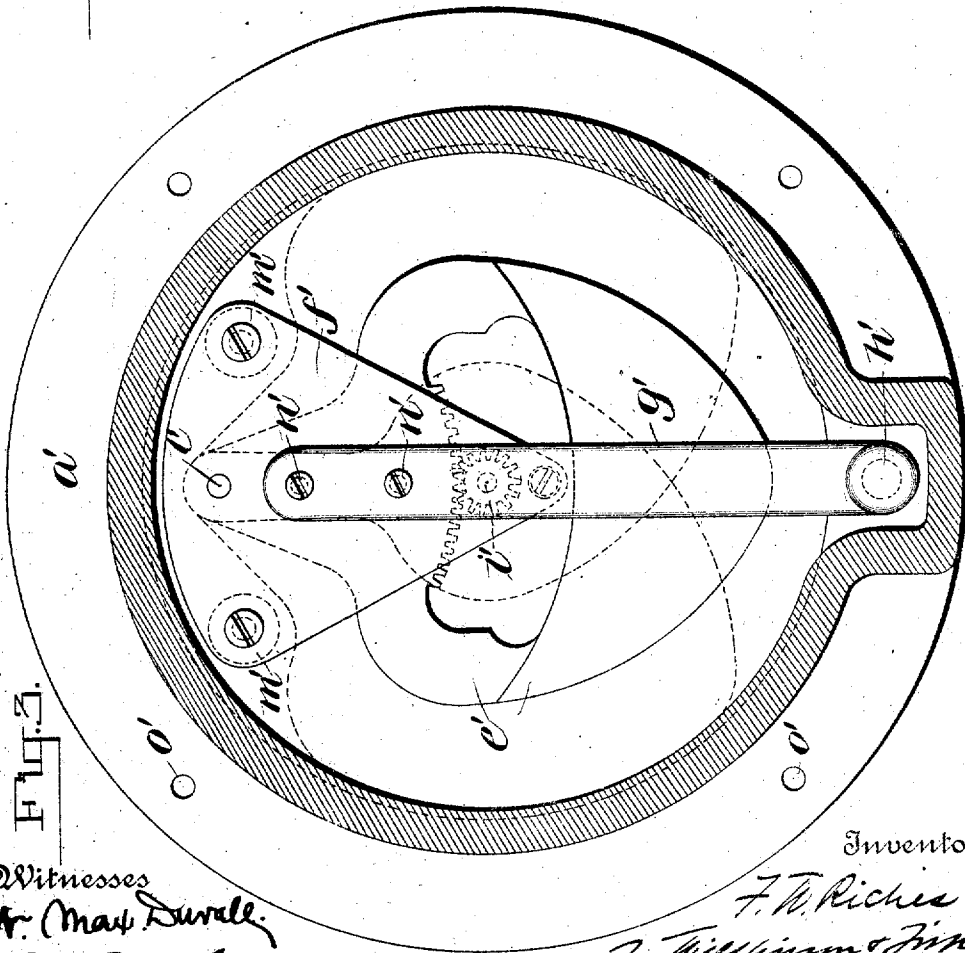
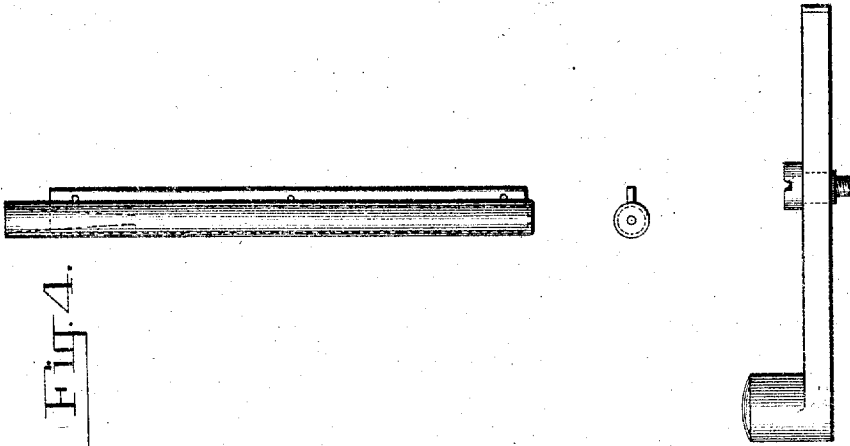
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Fig. 10.

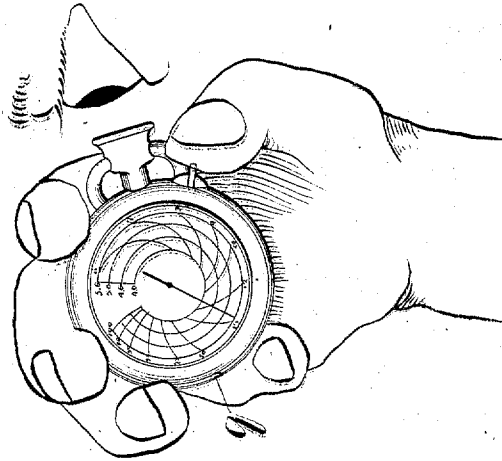
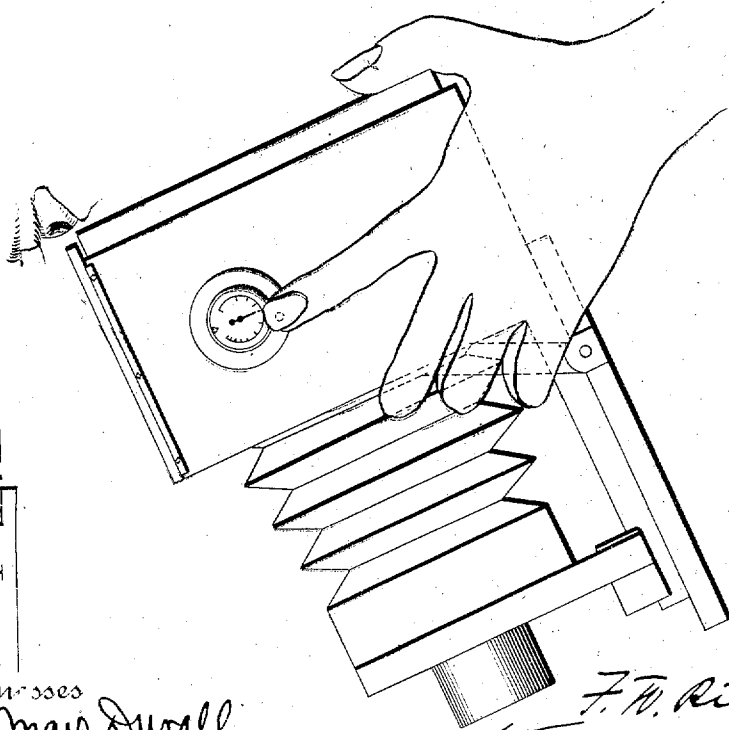


Fig. 5.



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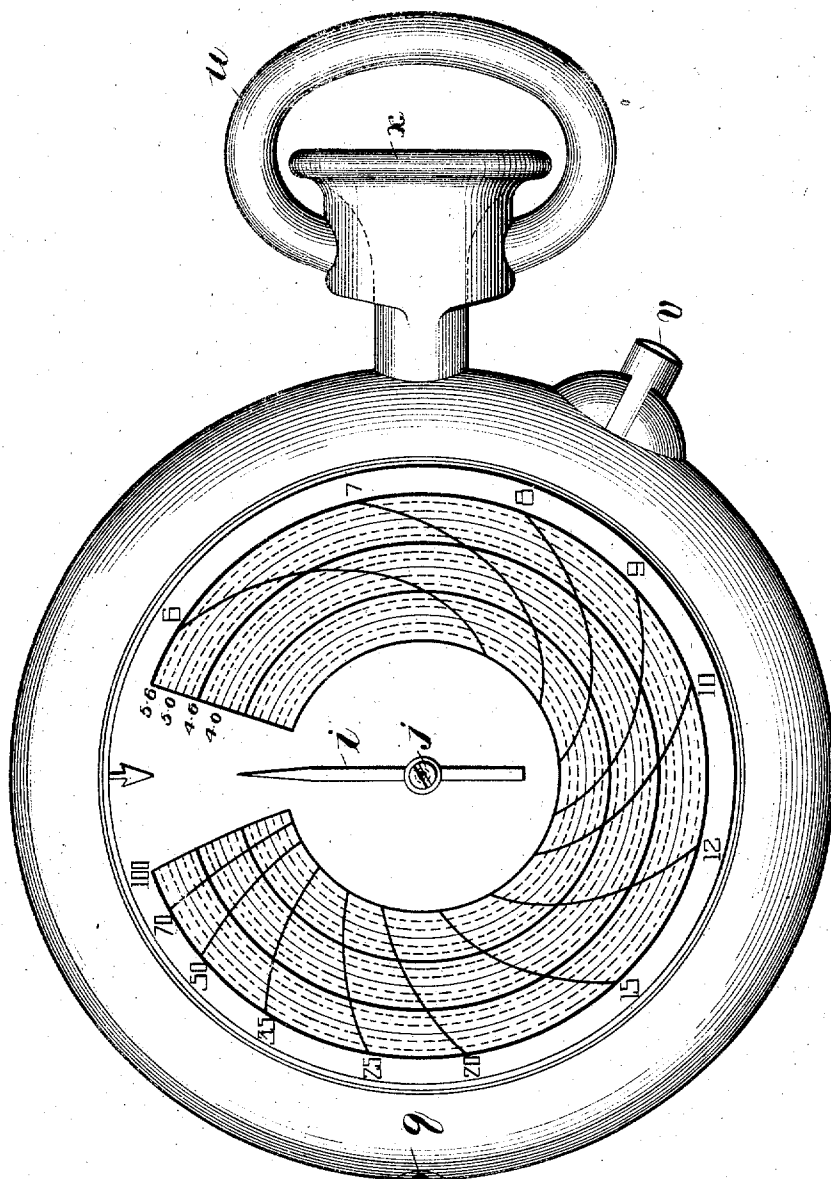
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6 SHEETS—SHEET 4.

Fig. 6.



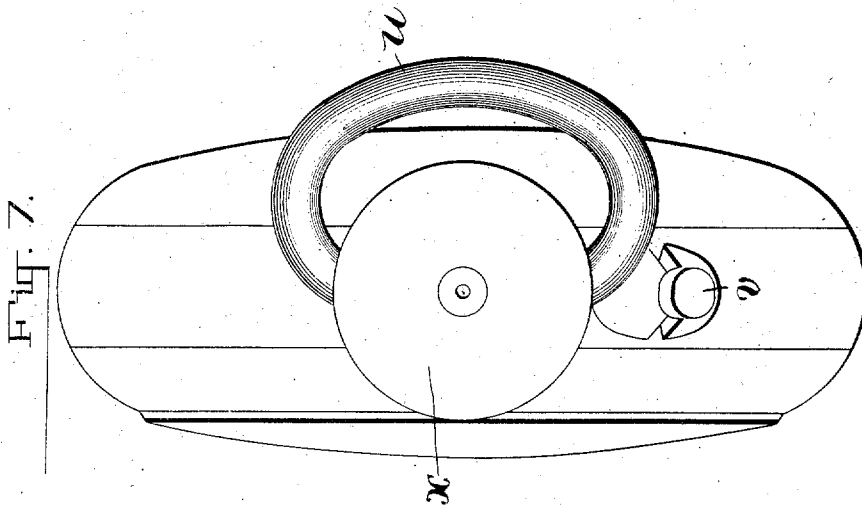
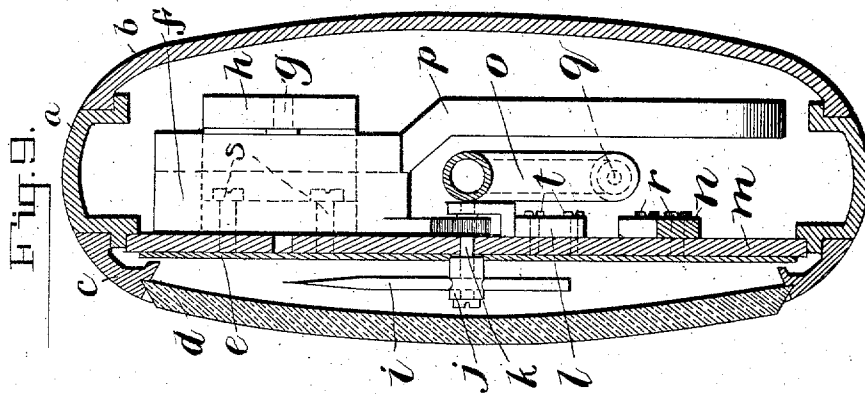
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6 SHEETS—SHEET 5.



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6 SHEETS—SHEET 6.

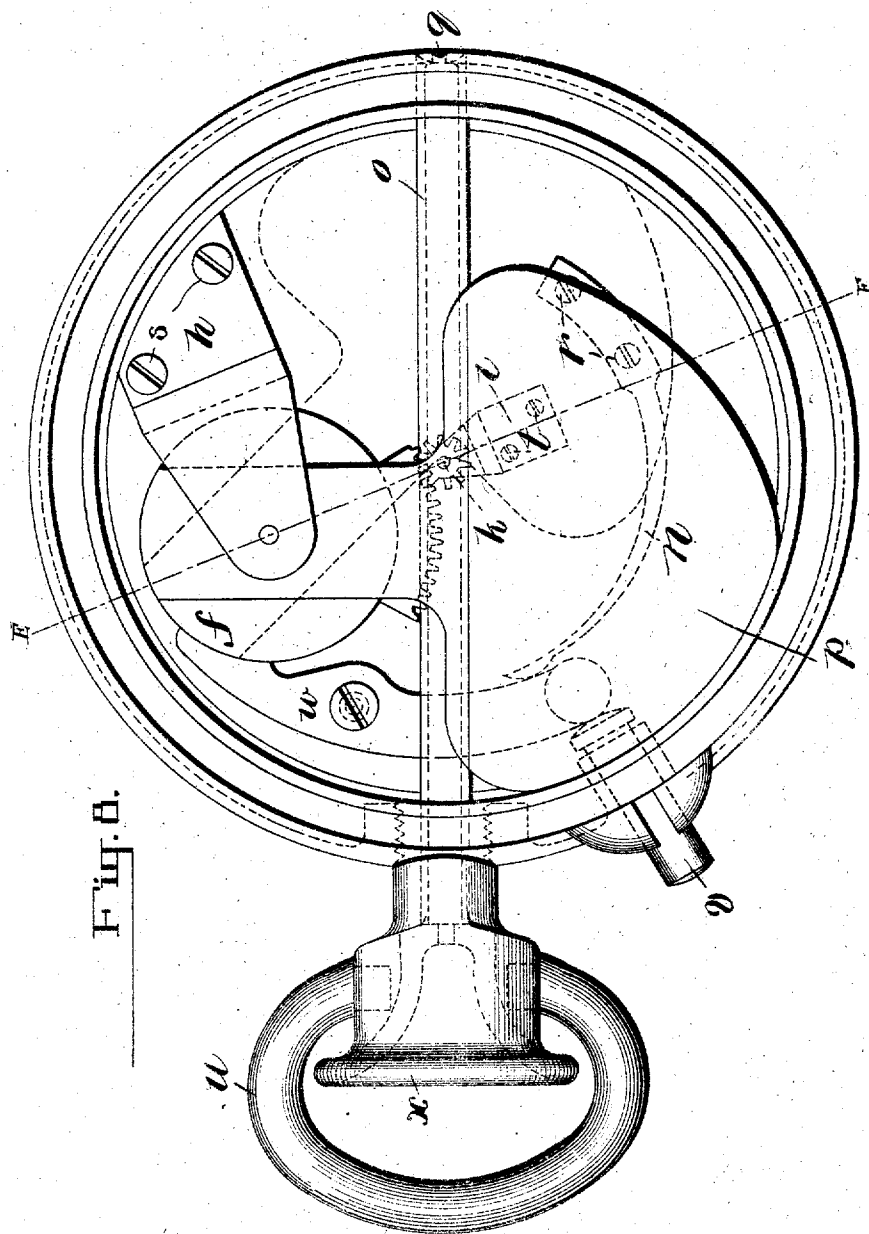


Fig. 8.

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UNITED STATES PATENT OFFICE.

FRANK WILLIAM RICHES, OF ST. PETERSBURG, RUSSIA.

TELEMETER FOR THE USE OF PHOTOGRAPHERS.

No. 884,955.

Specification of Letters Patent.

Patented April 14, 1908.

Application filed June 9, 1906. Serial No. 321,077.

To all whom it may concern:

Be it known that I, FRANK WILLIAM RICHES, a subject of the King of Great Britain, and a resident of St. Petersburg, Russia, (my post-office address being 11 Toutschkoff Pereoulouk,) have invented a Telemeter for the Use of Photographers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

This invention relates to a telemeter for the use of photographers to enable them to ascertain the distance at which an object may be situated from the observer and which it may be desired to photograph, so that the distance being correctly known by means of the telemeter the camera can be immediately fixed at the correct focus and the exposure made.

The telemeter consists of a sighting tube combined with or in a fixed relative position to the center of suspension of a plumb weight. When the sighting tube is horizontal the plumb weight hangs at right angles and vertical to it.

The sighting tube is directed to the base or ground line of the object to be photographed, and as the plumb weight will hang perfectly vertical, it will give the angle formed between the line of sight and a perpendicular line drawn from the eye of the observer to the ground. This angle by means of suitable gearing is multiplied and converted into a circular motion which is conveyed to the dial hand. The dial however, instead of being marked in degrees, for the sake of convenience is marked off to show the distances in feet or meters, so that the distances can be read off with the greatest ease.

This instrument also serves as a level and can be used to level the camera as when the dial hand is pointing to the arrow head which is marked on the dial, the sighting tube of the telemeter is at right angles to the plumb weight and is consequently in a perfectly horizontal line.

This instrument is for use on level ground, therefore should the base or ground line of the object to be photographed stand higher or lower than the ground on which the observer is placed, the necessary allowance must be made for this difference of level by

directing the sighting tube to a distance higher or lower than the object which would be level with the ground on which the observer stands.

This instrument is illustrated on the accompanying drawings, in which

Figure 1 is a front view of telemeter for fixing to the camera. Fig. 2 is a sectional view through the line A B, of Fig. 1. Fig. 3 is a section through the line C D of Fig. 2 and shows mechanism from the back. Fig. 4 is the sighting tube. Fig. 5 shows telemeter and sighting tube fitted to hand camera and method of using same. Fig. 6 is a front view of a modified form. Fig. 7 is a side view of the same. Fig. 8 is a rear view of the same with cover removed. Fig. 9 is a section on line E F of Fig. 8. Fig. 10 is a view showing method of use of this form.

Referring to Figs. 1 to 5: *a'*, case for mechanism—*b'*, ring frame for glass—*c'*, dial plate—*d'*, entablature plate—*e'*, plumb weight and toothed sector—*f'*, back bearing plate for spindles *l'* and *i'*—*g'*, stop spring for plumb weight—*h'*, push pin for spring—*i'*, pinion and spindle for dial hand—*j'*, dial hand or pointer—*k'*, cover glass for dial—*l'*, spindle for plumb weight and sector—*m'*, distance pieces and screws—*n'*, screws for fastening the stop spring to back bearing plate—*o'*, holes for screws for fastening telemeter to camera.

The plumb weight *e'* is suspended by spindle *l'* which works freely in the bearing holes in the entablature plate *d'* and back bearing plate *f'*, therefore whatever may be the vertical edge position of the telemeter, this plumb weight will, within predetermined limits, always hang vertical. Only a certain amount of angular travel of plumb weight is necessary and it is then stopped by striking against the case. The two necessary extreme positions of plumb weight are shown in dotted lines on Fig. 3. This plumb weight has a toothed sector gearing into the pinion on the spindle *i'* which has the dial hand affixed to it, therefore the necessary amount of angular movement of the plumb weight *e'*, by means of the toothed sector and the pinion and spindle *i'*, is multiplied and converted into circular motion which is conveyed to the dial hand *j'*.

For the purpose of retaining the plumb weight in the position that it has automatically assumed when the distance has been measured, a spring *g'* is provided which is

fastened to the back bearing plate f' by means of two screws n' , n'' . On the end of this spring is the push pin h' which extends up through an aperture in and slightly above the front flange of the casing. When in normal position this spring g' presses upon the plumb weight e' and does not allow it to move, but on pressing down the push pin h' the spring g' is also pressed down from contact with the plumb weight e' which is then free to swing in either direction. On removing the pressure from push pin h' the spring g' again presses against the plumb weight e' and holds it in the position in which it was at the moment of releasing the pressure on the push pin h' .

Fig. 4 is the sighting tube which consists of a tube having the metal of one end set over with a hole of about 1 millimeter diameter drilled in it. Into the other end of the tube is inserted an eye piece with a conical or taper hole in it which at the inner end is only about 1 millimeter in diameter. This tube is shown with a small rib along the outside, this rib is drilled with holes for the screws necessary for fixing it to the camera. Where the body of the camera is sufficiently thick, this rib is not necessary as a hole can be drilled through the body of the camera and the tube tightly inserted. This tube can be cut to any length to suit any size of camera.

The method of fixing and using this telescope is as follows:—The sighting tube Fig. 4 is fixed in a horizontal position on any convenient part of the camera Fig. 5 and the telescope is also fixed on any convenient part of the camera on any vertical plane parallel with the sighting tube and in such a manner that when camera and sighting tube are horizontal, the dial hand of telescope stands vertical and points to the arrow head p' , marked on the dial.

The camera is held in both hands in such a manner that the forefinger of one hand presses on the push pin h' , the eye is then applied to the sighting tube which is then directed to the base or ground line of the object to be photographed, Fig. 5. As soon as the lower edge of the object shows in the center of the aperture of the sighting tube, the push pin is released by the forefinger and the plumb weight and consequently the dial hand are held in this position, and the dial hand by its position on the dial plate will indicate the correct distance of the object from the observer in feet.

Referring to Figs. 6 to 10, a . body of case— b . back cover of case— c . ring frame for glass— d . cover glass for dial— e . dial plate— f . brake drum with toothed sector— g . spindle of brake drum— h . bracket for bearing for brake drum spindle— i . adjustable dial hand or pointer— j . boss with adjusting screw for dial hand— k . pinion and spindle for dial

hand— l . bracket and bearing for spindle for dial hand— m . entablature plate— n . spring for brake— o . sighting tube— p . plumb weight— q . aperture in end of sighting tube— r . screws for fastening brake spring to entablature plate— s . screws for fastening bracket h to entablature plate— t . screws for fastening bracket l to entablature plate— u . ring for fastening to watch chain— v . push pin for releasing brake— w . brake— x . eye piece for sighting tube.

The plumb weight p is fastened to the brake drum f which is suspended by a spindle g which works freely in the bearing holes in the entablature plate m and back bearing plate, or bracket h , and therefore whatever may be the upright position of the telescope, within certain predetermined limits, this plumb weight will always hang vertical. Only a certain amount of angular travel of plumb weight is necessary when it is stopped by striking against the case. The two necessary extreme positions of plumb weights are shown by dotted lines in Fig. 8.

The brake drum to which the plumb weight is fixed has a toothed sector gearing into the pinion on the spindle k which has a dial hand affixed to it, therefore the amount of angular movement of the plumb weight p , by means of the brake drum and toothed sector f and the pinion and spindle k is multiplied and converted into the circular motion which is conveyed to the dial hand i .

A brake or stop w is kept continually pressed against the drum f by means of the spring n . The push pin v is for pressing down against the brake and releasing its pressure on the drum f , so that the plumb weight will be free to swing and assume a vertical position.

The sighting tube o extends right through the case and at one end is closed over and has a small hole about 1 millimeter diameter drilled through it, the other end of the tube has an eye piece x and a ring u for fastening telescope to watch chain.

The method of using the pocket form of telescope is shown in Fig. 10. The instrument is held between the four fingers and thumb of one hand with the thumb pressing on the push pin v , care being taken that the fingers do not interfere with the direct and clear view through the aperture q of the sighting tube. The ring u is then swung aside and the eye is then applied to the eye piece x and the sighting tube is directed to the base or ground line of the object to be photographed, and as soon as the lower edge of the object shows in the center of the aperture of the sighting tube, the pressure on the push pin is released by the thumb and consequently the plumb weight and dial hand are held in the position assumed and will indicate on the dial the distance required.

As the angle formed between the line of sight and a perpendicular drawn from the

eye of the observer to the ground will vary according to the height of the eye of the observer from the ground for the same distance of objects, consequently the dial hand will also in the same manner vary in its position on the dial, therefore dial Fig. 6 has been designed. On this dial the circular lines represent the height of observer's eye above the ground in feet and inches, these heights on this particular dial are from 4 feet advancing by inches up to 5 feet 6 inches, but can be graduated in any other manner that may be required. The curved lines represent the distance of object from observer's eye. The points at which the curved lines intersect the circular lines give the distance of object from observer at the respective height of eye.

In Fig. 6 the dial hand is adjustable in the socket or boss, so that it is only necessary to measure the height of observer's eye from the ground and set the dial hand out from the center and fasten it with the set screw so that the point of the dial hand revolves on the circular line on dial which represents the height of observer's eye from ground. Where the curved lines intersect this circular line will be the correct distances of the object for this particular observer.

If required an ordinary simple hand and dial can be fitted specially graduated and solely for the particular height of observer as shown in Fig. 1.

Either style of dial and hand can be fitted to either style of telemeter.

It will thus be seen that in both forms of my invention I employ a sighting tube; a circular casing; a pendulous weight inclosed by the same, curved to conform to the interior wall of said casing, and having rack teeth rigid therewith. This pendulous weight, in each form of my invention, also, has a portion of its body offset, or extending in a plane to one side of the plane including the rack teeth, in order that more metal may be included therein, and at the same time other portions of the device may not be interfered with. This weight has its pivots in the entablature plate, and in a back plate or bracket in each form of my invention; and both forms of my device, also, employ a resilient brake normally in contact with said weight, and a push pin for controlling the brake.

Having thus described my invention, what I claim as new is—

1. In a telemeter, the combination of a circular casing, having an entablature plate; a sighting tube; a pendulous weight curved to conform to the interior of said casing, and having an offset body portion; rack teeth rigid with said weight; a back plate; a spindle pivoted in said entablature plate and in said back plate, on which said pendulum and rack teeth are mounted; a pointer; a pinion

on the same with which said rack teeth engage; a suitable dial over which said pointer plays; a resilient brake normally in contact with said weight; and a push piece for controlling said brake, substantially as described.

2. In a telemeter, the combination of an inclosing casing, a dial, a pointer, a shaft on which said pointer is mounted, a pinion on said shaft, and a plumb weight pivotally mounted in said casing and having its interior cut away and provided with teeth engaging said pinion, substantially as described.

3. In a telemeter, the combination of an inclosing casing, a dial carried thereby, a pointer, a shaft on which said pointer is mounted, a pinion on said shaft, a plumb weight pivoted in said casing and having its interior cut away and provided with teeth arranged in a curve and engaging said pinion, resilient means for preventing the movement of said weight, and a push button extending through said casing, whereby the user may disengage said means from said weight, substantially as described.

4. In a telemeter, the combination of an inclosing casing, a dial, a pointer, a shaft carrying said pointer, a pinion on said shaft, a plumb weight pivotally mounted in said casing and having its interior cut away, said weight surrounding said pinion, and provided with teeth arranged in a curve, said teeth engaging said pinion, a spring engaging said weight, and a push button connected to said spring and extending outwards through said casing, substantially as described.

5. In a telemeter, the combination of an inclosing casing; a sighting tube; a dial; a pointer; a shaft on which said pointer is mounted; a pinion on said shaft; and a plumb weight pivotally mounted in said casing and having its interior cut away and provided with teeth engaging said pinion, substantially as described.

6. In a telemeter, the combination of an inclosing casing; a sighting tube; a dial carried thereby; a pointer; a shaft on which said pointer is mounted; a pinion on said shaft; a plumb weight pivoted in said casing and having its interior cut away and provided with teeth arranged in a curve and engaging said pinion; resilient means for preventing the movement of said weight; and a push button extending through said casing, whereby the user may disengage said means from said weight, substantially as described.

7. In a telemeter, the combination of an inclosing casing; a sighting tube; a dial; a pointer; a shaft carrying said pointer; a pinion on said shaft; a plumb weight pivotally mounted in said casing and having its interior cut away, said weight surrounding said pinion, and provided with teeth arranged in a curve, said teeth engaging said pinion; a

spring engaging said weight; and a push button connected to said spring and extending outwards through said casing, substantially as described.

- 5 8. In a telemeter, the combination of a sighting tube, with a case; a pointer; a toothed gearing; a plumb weight pivotally supported in said casing, and serving to actuate said pointer through the medium of
10 said toothed gearing; a brake normally held in contact with said plumb weight and adapted for arresting said plumb weight at any point in its movement; a push piece extend-

ing out through said casing to be operated by the user to release said plumb from said means; and a dial specially graduated for indicating to persons their lineal distance from an object, substantially as described. 15

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses. 20

— FRANK WILLIAM RICHES.

Witnesses:

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